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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,167	01/24/2005	Shinya Kawachi	SHM-15820	2966

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EXAMINER	
BEST, ZACHARY P	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/517,167	KAWACHI ET AL.	
	Examiner	Art Unit	
	Zachary Best	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

FUEL CELL SEPARATOR AND METHOD OF MANUFACTURING THE SEPARATOR

Examiner: Z. Best S.N. 10/517,167 Art Unit: 1795 July 3, 2008

DETAILED ACTION

1. Applicant's amendment filed on June 3, 2008 was received. Claims 1 and 3-4 were amended. Claims 5-9 were newly added.

2. The text of sections of Title 35 U.S.C. not included in this action can be found in the prior Office Action issued on April 7, 2008.

Claim Objections

3. The objection to Claim 4 is withdrawn because Claim 4 was amended.

Claim Rejections - 35 USC § 102

4. The claim rejections under 35 U.S.C. 102(a-b) as anticipated by the admitted prior art and Matsukawa et al. (U.S. Patent No. 6,153,326 A) are withdrawn because independent claim 1 was amended.

Claim Rejections - 35 USC § 103

5. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa et al. (US 6,153,326 A) in view of Tanemoto et al. (US 6,395,416 B1).

Regarding Claim 1, Matsukawa et al. teach a fuel cell separator having a central part (31) and an outer peripheral part (33a, 33b), wherein multiple gas passages for guiding reaction gases and multiple reaction product passages for guiding a reaction product are provided by the outer peripheral part (38), the reaction gases being guided from the gas passages to the central part and the reaction product produced at the central part being guided to the reaction product passages (43), wherein the central part comprises a metal member (31), the peripheral part comprises a rubber member (33a, 33b), and a projecting part surrounding the central part is formed integrally with the rubber member (21), wherein an inner portion of the peripheral part overlays the central part, said projecting part being provided by said inner portion of said peripheral part (fig. 4). However, Matsukawa et al. do not specifically teach an outer portion of the peripheral part extends away from the central part, and the gas passages and reaction product passages are formed through said outer portion.

Tanemoto et al. teach a fuel cell separator having a central part (102) and an outer peripheral part (103), wherein an outer portion of the peripheral part extends away from the central part (fig. 4C), and the gas passages and reaction product passages are formed through said outer portion (101a, 101b, and 101c as seen in fig. 5). It would be advantageous to create the structure of Tanemoto et al. because it would improve gas tightness of the fuel cell (col. 3, lines 39-48). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the fuel cell separator of Matsukawa et al. wherein an outer portion of the peripheral part extends away from the central part, and

the gas passages and reaction product passages are formed through said outer portion because Tanemoto et al. teach said structure will result in improved gas tightness of the fuel cell.

Regarding Claim 2, Matsukawa et al. teach the rubber member is made of silicone (abstract).

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa et al. (U.S. Patent No. 6,153,326 A) in view of Tanemoto et al. (US 6,395,416 B1) and further in view of Styczynski (U.S. Patent No. 6,113,827 A).

Regarding Claim 3, Matsukawa et al. teach a method for manufacturing a fuel cell separator, said fuel cell separator having a silicone rubber peripheral part (33a, 33b) and a metal central part (31), wherein multiple gas passages for guiding reaction gases and multiple reaction product passages for guiding a reaction product are provided by the peripheral part (38), reaction gases being guided from the gas passages to the metal central part and reaction product produced at the central part being guided to the reaction product passages (43), comprising the steps of: disposing the metal central part in a cavity of an injection-molding mold (col. 3, lines 55-57), maintaining an inside of the cavity at a specific temperature to control the viscosity of the silicone (col. 2, lines 42-47), injecting a liquid silicone rubber into the cavity while said cavity is at the maintained temperature and guiding the liquid silicone rubber to an edge part of the central part (col. 3, lines 38-48). While Matsukawa et al. does teach the importance of mold temperature in relation to the viscosity and set properties of

the silicone rubber, Matsukawa et al. do not specifically teach forming the gas passages and the reaction product passages through the liquid silicone rubber that has been guided past the edge part of the central part and fail to teach the step of heating the central part to reactively set the silicone rubber guided to the edge part of the central part.

Tanemoto et al. teach a fuel cell separator having a central part (102) and an outer peripheral part (103), wherein an outer portion of the peripheral part extends away from the central part (fig. 4C), and the gas passages and reaction product passages are formed through said outer portion (101a, 101b, and 101c as seen in fig. 5). Tanemoto et al. further teach the method of creating said outer peripheral part by injection molding means (col. 4, lines 21-33). It would be advantageous to create the structure of Tanemoto et al. because it would improve gas tightness of the fuel cell (col. 3, lines 39-48). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the method for manufacturing the fuel cell separator of Matsukawa et al. comprising the additional step of forming the gas passages and the reaction product passages through the liquid silicone rubber that has been guided past the edge part of the central part because Tanemoto et al. teach said resultant structure will improve the gas tightness of the fuel cell.

Styczynski teaches a method if injection molding silicone comprising the steps of injecting silicone rubber into the mold at a temperature such that the rubber will not reactively set (col. 5, lines 40-42) and then heating the mold cavity to a sufficient degree that will set the silicon rubber (col. 5, lines 49-51). Styczynski teaches that it is advantageous to use this method because it will ensure that the silicone will not prematurely set (col. 5, lines

40-42). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the method of Matsukawa et al. and Tanemoto et al. with the additional steps of injecting silicone rubber into the mold at a temperature such that the rubber will not reactively set and then heating the mold cavity to a sufficient degree that will set the silicon rubber (inherently heating the metal central part as well) because Styczynski teach that it will protect against premature setting of the silicone rubber.

7. Claims 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa et al. (U.S. Patent No. 6,153,326 A) in view of Styczynski (U.S. Patent No. 6,113,827 A).

Regarding Claim 4, Matsukawa et al. teach a method for manufacturing a fuel cell separator, said fuel cell separator having a silicone rubber peripheral part (33a, 33b) and a metal central part (31), wherein multiple gas passages for guiding reaction gases and multiple reaction product passages for guiding a reaction product are provided by the peripheral part (38), reaction gases being guided from the gas passages to the metal central part and reaction product produced at the central part being guided to the reaction product passages (43), comprising the steps of: disposing the metal central part in a cavity of an injection-molding mold (col. 3, lines 55-57), maintaining an inside of the cavity at a specific temperature to control the viscosity of the silicone (col. 2, lines 42-47), injecting a liquid silicone rubber into the cavity while said cavity is at the maintained temperature and guiding the liquid silicone rubber to an edge part of the central part (col. 3, lines 38-48). While Matsukawa et al. does teach the importance of mold temperature in relation to the viscosity and set properties of

the silicone rubber, Matsukawa et al. fail to teach the step of heating the central part to reactively set the silicone rubber guided to the edge part of the central part.

Styczynski teaches a method if injection molding silicone comprising the steps of injecting silicone rubber into the mold at a temperature such that the rubber will not reactively set (col. 5, lines 40-42) and then heating the mold cavity to a sufficient degree that will set the silicon rubber (col. 5, lines 49-51). Styczynski teaches that it is advantageous to use this method because it will ensure that the silicone will not prematurely set (col. 5, lines 40-42). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the method of Matsukawa et al. with the additional steps of injecting silicone rubber into the mold at a temperature such that the rubber will not reactively set and then heating the mold cavity to a sufficient degree that will set the silicon rubber (inherently heating the metal central part as well) because Styczynski teaches that it will protect against premature setting of the silicone rubber.

8. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa et al. in view of Tanemoto et al., as applied to Claims 1-2, and in further view of Kuroki et al. (7,226,685 B2).

Matsukawa et al. in view of Tanemoto et al. teach the fuel cell separator as recited in Paragraph 5, above. However, Matsukawa et al. in view of Tanemoto et al. fail to teach a support hole through the central part filled by the rubber member.

Kuorki et al. teaches a gasket for a fuel cell wherein a support hole (34) is defined through a central part adjacent to an edge of the central part (fig. 6), the support opening being filled by a rubber member so as to attach the rubber member to the central part (col. 13, lines 46-57). It would be advantageous to add the support hole because it would more firmly attach the peripheral part to the central part (col. 16, lines 1-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the fuel cell separator of Matsukawa et al. in view of Tanemoto et al. wherein there is a support hole defined through the central part adjacent to an edge of the central part, the support opening being filled by the rubber member so as to attach the rubber member to the central part because Kuorki et al. teach support hole gives improved security of the peripheral part to the central part. Alternatively, simple substitution of one known element for another to obtain predictable results would have been obvious to one having ordinary skill in the art. *See KSR v. Teleflex*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007).

Regarding Claim 6, Matsukawa et al. and Kuorki et al. individually teach said rubber member is made of silicone rubber (abstract and col. 4, lines 40-53, respectively).

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa et al in view of Styczynski, as applied to Claim 4, and further in view of Tanemoto et al. (US 6,395,416 B1).

Matsukawa et al. in view of Styczynski teach the method as recited in Paragraph 7, above. However, Matsukawa et al. in view of Styczynski do not specifically teach forming

the gas passages and the reaction product passages through the liquid silicone rubber that has been guided past the edge part of the central part and forming the gas passages and the reaction product passages through the liquid silicone rubber at locations spaced from the central part.

Tanemoto et al. teaches a method of creating a fuel cell separator by injection molding silicone said fuel cell separator having a central part (102) and an outer peripheral part (103), wherein an outer portion of the peripheral part extends away from the central part (fig. 4C), and the gas passages and reaction product passages are formed through said outer portion (101a, 101b, and 101c as seen in fig. 5). Tanemoto et al. further teach the method of creating said outer peripheral part by injection molding means (col. 4, lines 21-33). It would be advantageous to create the structure of Tanemoto et al. because it would improve gas tightness of the fuel cell (col. 3, lines 39-48). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the method for manufacturing the fuel cell separator of Matsukawa et al. in view of Styczynski comprising the additional step of guiding the liquid silicone rubber over and past the edge of the central part such that the silicone rubber extends away from the central part and forming the gas passages and the reaction product passages through the liquid silicone rubber that has been guided past the edge part of the central part because Tanemoto et al. teach said resultant structure will improve the gas tightness of the fuel cell.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa et al. in view of Tanemoto et al. and further in view of Styczynski, as applied to Claim 3, and further in view of Kuroki et al. (7,226,685 B2).

Regarding Claim 8, Matsukawa et al. in view of Tanemoto et al. and further in view of Styczynski teach a method for manufacturing a fuel cell separator as recited in Paragraph 6, above. However, Matsukawa et al. in view of Tanemoto et al. and further in view of Styczynski fail to teach the step of filling a hole defined through the central part with liquid silicone rubber.

Kuroki et al. teach the method of filling a hole in a central part with liquid rubber for use in a fuel cell, the hole being inwardly adjacent to the edge part of the central part, so as to positively interconnect the central part and the peripheral part (col. 7, lines 58-67). It would be advantageous to add the support hole because it would more firmly attach the peripheral part to the central part (col. 16, lines 1-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the method of manufacturing a fuel cell separator of Matsukawa et al. in view of Tanemoto et al. and further in view of Styczynski further comprising the step of filling a hole defined through the central part with liquid silicone rubber, the hole being inwardly adjacent to the edge part of the central part, so as to positively interconnect the central part and the peripheral part because Kuroki et al. teach the support hole positively connected via rubber would more firmly attach the peripheral part to the central part. Alternatively, simple substitution of one known element for another to obtain predictable results would have

been obvious to one having ordinary skill in the art. *See KSR v. Teleflex*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007).

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa et al. in view of Tanemoto et al. and further in view of Styczynski, as applied to Claim 4, and further in view of Kuroki et al. (7,226,685 B2).

Regarding Claim 9, Matsukawa et al. in view of Styczynski teach a method for manufacturing a fuel cell separator as recited in Paragraph 7, above. However, Matsukawa et al. in view of Styczynski fail to teach the step of filling a hole defined through the central part with liquid silicone rubber.

Kuroki et al. teach the method of filling a hole in a central part with liquid rubber for use in a fuel cell, the hole being inwardly adjacent to the edge part of the central part, so as to positively interconnect the central part and the peripheral part (col. 7, lines 58-67). It would be advantageous to add the support hole because it would more firmly attach the peripheral part to the central part (col. 16, lines 1-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the method of manufacturing a fuel cell separator of Matsukawa et al. in view of Styczynski further comprising the step of filling a hole defined through the central part with liquid silicone rubber, the hole being inwardly adjacent to the edge part of the central part, so as to positively interconnect the central part and the peripheral part because Kuroki et al. teach the support hole positively connected via rubber would more firmly attach the peripheral

part to the central part. Alternatively, simple substitution of one known element for another to obtain predictable results would have been obvious to one having ordinary skill in the art. *See KSR v. Teleflex*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007).

Response to Amendment

12. Applicant's arguments filed on June 3, 2008 have been fully considered, but they are not persuasive:

Applicant argues:

(a) Heating the cavity does not equate to setting the liquid silicone rubber by heating the central part;

(b) Styczynski is not analogous art because Styczynski does not teach an element corresponding to the central part and does not teach any fuel cell elements.

In response to Applicant's arguments:

(a) Within the constraints of the teachings of Applicant, Examiner cannot envision how heating the mold cavity as taught by Styczynski wherein a metal central part is in the mold cavity, metal being well known for its high thermal conductivity, would not also heat the metal central part. Examiner's retains the position that heating the mold cavity after the silicone rubber has been guided through the mold will also heat the metal central part located within the mold cavity. Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55,

44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22,13 USPQ2d, 1320, 1322 (Fed. Cir. 1989).

(b) Styczynski teaches a method for injection molding liquid silicone rubber onto a substrate, wherein the substrate is located within the confines of the mold cavity (col. 5, lines 20-55). The particular teaching that a person having ordinary skill in the art would take notice of because of the shared common technological ground of injection molding liquid silicone rubber onto a substrate within a mold cavity of Applicant and Styczynski is that by injecting the liquid silicone rubber into the mold cavity and then heating the mold cavity the liquid silicone rubber will not prematurely set. Although Styczynski does not teach its method to create a final product for use in a fuel cell, its teaching would be applicable to a person having ordinary skill in the art using injection molding processes to inject liquid silicone rubber into a mold cavity and onto a substrate. A prior art reference is analogous if the reference is in the field of Applicant's endeavor or, if not, the reference is reasonably pertinent to the particular problem with which the inventor was concerned. In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Best whose telephone number is (571) 270-3963. The examiner can normally be reached on Monday to Thursday, 7:30 - 5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

zpb

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795